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On the Methodological Profile of the Research of Excellence

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Abstract: *The aim of the paper is to ground and examine the basic methodological profiles of the scientific researchers involved in doctoral and post-doctoral scientific research of excellence. To this end, firstly, some considerations on the general concepts of knowledge, scientific research, and scientific knowledge are provided. Next, the main (11) specific features of the economic/social field (compared with the natural one) are identified and interpreted. Based on the two issues, the third step is to propose the concept of what is called d-paradigm vs. the k-paradigm (i.e., the well-known Kuhnian paradigm), by examining its mechanism as a cognitive paradigm assigned to doctoral and post-doctoral scientific research of excellence. A Seven types of approach compatible (or, principled, required) by the d-paradigm are identified and commented in their peculiarities. The last contribution of the paper is the proposal for three fundamental methodological profiles of the scientific researchers involved in the doctoral or post-doctoral scientific research of excellence. Two annexes bring some details on the issues discussed in the main body of the paper*.

Keywords: knowledge; scientific research; excellence; paradigm; methodological profile.

Introduction

Knowledge

To get the concept of knowledge, it is necessary to travel the road from Nature to Culture, so to speak. The first step, here, is the perception of signals, where the perception „device" belongs to the subject,[i] and the signals can belong both to the subject (the same or other) and to Nature, where by Nature is understood both the non-anthropogenic and anthropogenic environment. Signals refer to any change in the *status quo* so that the mentioned change is perceived by the subject. The sufficient condition that a signal be perceived is the following: the signal in question must bear a sign. In fact, a sign arises when a change in the *status quo* arises, too. Let us introduce some notations:

- (S): the set of signals
- (C): the set of changes that are signalled through the signals
- (s): the set of signs that are perceived by the subject

So, there are the following relationships among the mentioned sets:

$$(s) \subseteq (C) \subseteq (S)$$

The subject can perceive the signs if and only if those signs are already registered in a „list" of signs which the subject holds, generally based on one's own experience (*a posteriori* signs) or based on the Kantian forms of intuition[ii] (*a priori* signs). When a signal affects the subject's (six) senses, s/he compares the signs in the signal with the signs in the list and, if s/he finds in the list the sign of the signal, then the sign in the case is perceived. In the contrary case, the sign is either ignored or added to the list as a new sign. So, that list is permanently actualized by the very daily experience.

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The perception is „transferred" from the senses to the intellect, where they become concepts. The concepts are then integrated into a reasoning or a chain of reasoning. A reasoning is a proposition expressed linguistically (either verbal or formal) about reality (things, properties, relationships – see note 3 below). What we call cognisance (Nota bene: a cognisance is an „individual" of the knowledge population) is the very content of a proposition about reality. A set of cognisances, ordered and structured according to a theoretical/metaphysical/theological/artistic framework (for example, a system of axioms), constitutes what is called knowledge. For the moment, both cognisance and knowledge are just an opinion, more or less sophisticated, about reality. To become an episteme, the opinion must be factually testable (see also below). Even corroborated through effective testing, the episteme is always provisional, since it could always be refuted in the future.

Scientific research

The scientific research (SR) is a very specific action/activity, either at the individual or societal level, which is characterized by the following sufficiency predicates:

(1) (P) has as a purpose to acquire scientific knowledge of reality;[iii]
(2) (R) model of rationality concerning the object of research;
(3) (M) unfolds based on a pre-established methodology of research, usually of a deductive (or, at least, an abductive) approach.

Non-mandatorily, the scientific research proceeds, regularly, inside a cognitive paradigm (CP), either explicitly or implicitly (Kuhn, 2012; Dinga *et al*., 2022), or following a (specific) research program[iv] (RP) (Lakatos, 1980). Consequently, the hard core of the definition of scientific research is delivered by the logical conjunction (the PRM framework):

$$\overline{SR} \leftarrow (P) \wedge (R) \wedge (M)$$

while the complete definition will add the two contingent predicates:

$$SR = (\overline{SR}) \cup \{(CP) \vee (RP) \vee [(CP) \wedge (RP)]\}$$

Scientific knowledge

The scientific knowledge (SK) is, obviously, a species of knowledge. So, the proximal genus of the scientific knowledge is the (general) knowledge. To get the definition of the scientific knowledge, we must identify, based on Ockham's razor, the specific differences.[v] I think the following specific differences should be retained:

(1) (A) is an artefact, that is, is objectified in one way or another, usually by communication at the society level;[vi]
(2) (V) is inter-subjectively validated, by the intermediation of a „vote" within the scientific community, regularly inside the cognitive paradigm concerned;
(3) (T) is factually testable. It is important, here, to provide two important considerations:
   - a (presumptive) scientific knowledge is not mandatorily required to be actually tested, but it is sufficient to provide a convincing proof (demonstration) that it is testable, so the mark of the scientificity is simply the (factual) testability;
   - there is a difference between the concepts factual and empirical – while the factual is a repeatable event (phenomenon), the empirical is a singular one. It is obvious that the testability is concerned with factual, not empirical; for example, the corroboration of a prediction by the assigned factual must allow the possibility that factual refute the same prediction in the future, which is impossible for an empirical event to do.

Nota bene 1: There is no crisp overlapping between the scientific research and scientific knowledge; the scientific knowledge can also be acquired outside scientific research (for example, by the intermediation of intuition), and, in turn, the scientific research can also acquire non-scientific knowledge. However, most part of the scientific research provides

scientific knowledge, and most of the scientific knowledge is provided by scientific research.
Nota bene 2: according to the specific difference (T) the scientific knowledge obeys agnosticism.
Consequently, the scientific knowledge (SK) is delivered by that knowledge which cumulatively verifies the three sufficiency predicates. If we denote the (general) knowledge with K, then we can write:

$$SK = (K)\wedge(A)\wedge(V)\wedge(T)$$

what means that the non-scientific knowledge ($\bar{S}K$) can be formally described as follows:

$$\bar{S}K = (K)\wedge\{(\bar{A})\vee(\bar{V})\vee(\bar{T})\vee[(\bar{A})\wedge(\bar{V})]\vee[(\bar{A})\wedge(\bar{T})]\vee[(\bar{V})\wedge(\bar{T})]\vee[(\bar{A})\wedge(\bar{V})\wedge(\bar{T})]\}$$

On the cognitive peculiarities of the socio/economic field

From the methodological perspective, the socio/economic field holds some characteristics which shape the research activity in that field. I will shortly mention 11 such peculiarities.

(1) The observer is inside the observed system

The observer (the human being) is a component part of the observed system. This means the observed system is either a cybernetic system of order 2 (natural system containing cultural subjects) or a cybernetic system of order 4 (artefactual system containing cultural subjects). Logically, the subject is difficult to discern from the object in the cybernetic systems of order 4, as are, for example, the economic systems.

(2) Isolating a system to be studied breaks relationships that are irremediable

Isolation of a system as a cognitive object breaks unavoidable relationship between the "cut out" system and the environment that forms itself around that system. These „cut out" relationships cover the entire relational spectrum: they are of the causal type, of the structural type, and of the functional type. The cognitively isolated system co-exists with its environment: system change interacts with environmental change, in a complex network of mutual influences[vii] (generally called co-evolution).

(3) The initial conditions are necessarily non-invariant

The initial conditions of any social/economic system are necessarily non-invariant. It is not about the (general) fact that the initial conditions could change (this phenomenon is shared by any system, of any order of cyberneticity), but about the fact that, in the economic/social field, such non-invariance of the initial conditions is necessary. This necessity comes from the existence of free will, which is present only in the cybernetic systems of order 4, because of the presence of (at least) a human being.

(4) Impossibility of induction

The induction is impossible in the socio-economic field. Any inductive result (i.e., any result inductively obtained) has an exclusively local validity (both in time and space). However, the scientificity of a cognitive result implies its de-contextualization (at least at the level of generality, but it would be desirable to achieve universality).[viii]

(5) Difficulty of identifying the invariants

The invariants (formal or simply heuristic) are very difficult to identify in the economic/social field. Since scientificity means, ultimately (i.e., as the highest instance), the identification/construction of invariants, this difficulty or cognitive vulnerability must be precautionarily counted when scientific research is intended.[ix]

(6) Overwhelming domination of heuristic invention

In the economic/social field, there is rather invention (of concepts, mechanisms, and so on) than discovery. This is because the economic/social field is a (macro) artefact of human beings, more exactly, of the society that the human beings edify. Somewhat, the economic/social field is an artificial construction of humans, although some necessity cannot be excluded from this fact. Consequently, in this field, the "need" for imagination[x] and intellectual courage is much greater than in the natural realm, and so, the risk of a wrong direction of research is higher than in the natural domain.[xi]

(7) The law of movement is necessarily non-invariant

In science, the laws of movement are the crucial intellectual construction, since they play the role of ontological principles. The same can be said about mathematics – the algebraic

functions are exactly laws of movement regarding the respective sets of mathematical objects, and, of course, about logic – e.g., a syllogism is a… law of movement regarding the reasoning. What is specific for the economic/social field in this matter is the fact that the laws of movement are non-invariant,[xii] so it can be said that, in this field, there are no laws in the strong sense, as there are in the natural field. I argue this statement as follows:

- the law of movement in the economic/social field addresses the individual behaviour (decision-making, and action, respectively);
- the individual behaviour is a function of all the parameters (economic, social, psychological, sociological, political, cultural and so on) that an individual holds;
- the (inherent) volatility of those parameters is very high, depending on the volatility of other causal factors, either internal or external of that individual;
- the behavioural contagion, e.g., through memes (Dawkins, 2003), is one of the main causes of changing the law of movement.[xiii]

(8) The truth and testing are necessarily contextually closed

This peculiarity of the economic/social field from the perspective of research and knowledge is, without any doubt, the most important and relevant one. As I will develop below, in this field the truth is not anymore of the type of correspondence-truth, that is, loses, somewhat, its ontological meaning, since both the truth and its testing (either logically or factually) are impregnated by values, desirabilities, expectations, what transform the economic/social knowledge into a hermeneutical process, without a real anchoring in the ontological phenomenology. Especially, the testing of the truth of hypotheses/conjectures evades from the inter-subjective validation (e.g., the „vote" of the scientific community in the field concerned).

(9) Most of the time, the effect is antecedent to the cause

The principle of causality is strongly affected by the Newtonian (natural) presupposition that the cause precedes (both chronologically and logically) the effect, so that, based on the Latin maxim „*post hoc, ergo propter hoc*", the effect is generated by the cause. However, such a supposition is based on a choice of the cause, namely on choosing the efficient (or, more exactly, effective) cause. But in the economic/social field, any decision-making and correlative action (either act or abstention) is generated by the purpose/goal. So, the true cause of the behaviour is the Aristotle-ian *causa finalis*. *Causa finalis* precedes the *causa efficiens*, so that the *causa efficiens* become the effect of the... effect.[xiv]

(10) Explanation is replaced with comprehension

An explanation is a (non-ambiguous) description of a causality. Unfortunately, in the economic/social field, the causality is, almost always, replaced with either correlation or causal mechanisms.[xv] Consequently, in the field of interest in this study, the explanation is replaced with the comprehension. The comprehension requires rather intuition than the reasoning based on a model of rationality. Of course, the reasoning aimed at getting the intelligibility of the domain concerned does not totally lack, but it is not anymore overwhelming dominant, as in the natural sciences.

(11) Applicable logic is not of bivalent type

As a consequence of point (8) above, it seems that the bivalent logic (with two truth values, i.e., *tertium non datur* – true, and false, respectively) is no longer applicable to the economic/social field. This means it is necessary to edify a new logic that should use some kind of teleological truth, by replacing the correspondence-truth of the bivalent logic. Elsewhere, I proposed a tetravalent logic, with four truth values, i.e., obeying the principle *quintum non datur* (Dinga, 2024).

The paradigm of doctoral and post-doctoral research of excellence

On the Kuhnian concept of paradigm

A stylized description of the concept of (cognitive) paradigm[xvi], as it is proposed by Thomas Kuhn (2012), is provided below:

- the Kuhnian paradigm (which I proposed to call *k-paradigm*) constitutes, essentially, a constellation of values, attitudes, rules and procedures for approaching the object of research, shared by a scientific community concerned with a distinct field of knowledge/research;

- the k-paradigm (and not theory, which may, perhaps, impose a paradigm) is the fundamental unit of knowledge;
- the k-paradigm rigidifies (but, at the same time, increases the efficaciousness of) the research within normal science (which is aimed at solving puzzles, i.e., non-innovative problems).

The basic functions that the k-paradigm performs are:

- selects research topics/themes (by ignoring those that do not "fit" the paradigm);
- favours the application of certain models/rules/procedures of knowledge;
- solves puzzle problems (i.e., „known" ones, with expected results or fulfilling certain conditions), i.e., carries out normal science (research);
- "sweeps under the rug" (to an established, however, point) the anomalies discovered in solving puzzle problems.

Generally, there are no (genuine) particularizations of the k-paradigm for the economic/social field (Dinga *et al*, 2022). Consequently, this state of affairs urgently requires a programmatic approach, of both conceptual and methodological type, aimed at elaborating a praxiological paradigmatic model for this field.

A proposal: the d-paradigm

Since my objective here is to discuss the (needed) excellence in the doctoral and post-doctoral research, I would try to propose a paradigm focused on this purpose. I would coin such a paradigm *d-paradigm* („d" comes from doctoral).

Prima facie, it seems that the d-paradigm is, somewhat, unproper, when confronted with the k-paradigm; consequently, it should be "defended" against the k-paradigm, as follows:

- the Kuhnian paradigm (k-paradigm) refers to a scientific community concerned with the same field of scientific interest, while the "paradigm" intended here refers to a certain category of researchers that can be distributed in several (different) fields of knowledge (possibly, unrelated to each other)**;**
- by abstracting from this difference, a concept can be constructed that we can call d-paradigm, that would "order", from a paradigmatic point of view, doctoral and post-doctoral research, regardless of the field of scientific interest addressed.

There are two basic similarities between k-paradigm and d-paradigm:

- both provide a homogeneous framework for carrying out research activity, by constituting "normal research";[xvii]
- both suggest common rules, procedures, methods and research tools for the scientific communities they describe (so, both are prescriptive/normative in nature).

There are, also, two basic differences between the two types of paradigm:

- k-paradigm refers to a homogeneous scientific community, while d-paradigm refers to a homogeneous research standing that can include several scientific communities, non-homogeneous among them as research topics;
- k-paradigm "prescribes" what and how to research, d-paradigm "prescribes" the performance required of research.

In Annex 1 is shown the positioning of the d-paradigm, from the perspective of its (current) performance in research, regarding the general typology of sciences.

The mechanism of the d-paradigm

The mechanism of the d-paradigm can be sketched by revealing four "ingredients": (a) the values involved; (b) the attitudes exhibited; (c) the rules/procedures used; (d) the logic of d-paradigm.

(a) The values

The first value of the d-paradigm refers to the level of research developed. These paradigms always work at the fundamental level, i.e., they aspire to get the most basic principles of reality taken into examination, so, generally, the d-paradigm does not develop (or should not do so) local, concrete, or particular scientific research. The second value is the (mandatory) *interdisciplinary* approach. This value is problematic in the case of k-paradigm since, although the k-paradigm can bring under its "hat" many cognitive

disciplines, they behave in a multi-disciplinary way, not inter-disciplinary.[xviii] The reason for this state of affairs consists in the following: the k-paradigm "view" the world, i.e., its knowledge object, exclusively through the filter primordially accepted for the paradigm in the case, which means that the convoked disciplines are allowed to only illuminate, from their own perspective the knowledge object, but are not allowed to interfere among them (this interferences, inter-communications are exactly the meaning of the interdisciplinarity). The third value of the d-paradigm consists in the *problematization* of the knowledge object. By problematization is understood the elaboration of the complete list of pertinent questions associated with a given problem (Nota bene: the pertinent question is that question that targets any "corner" of the interrogative frame, or any combination of "corners" of the interrogative frame (see Annex 2). The function of problematization addresses the exhaustion of the knowledge potential of a problem under examination, ad the usefulness of problematization addresses the ensuring of the internal, self-catalyzing logic of knowledge.[xix] There are three stages of problematization: (a) pre-research problematization: solving the problem is preceded by drawing up the exhaustive list of pertinent questions; (b) intra-research problematization: questions are formulated in the process of solving the problem; (c) post-research problematization: questions are formulation within the margin of the identified solution in order to identify the next directions of research.

(b) The attitudes

The first attitude exhibited by a d-paradigm is the *a-contextual* research, which leads to an abstract approach of the knowledge object – obviously, the a-contextual examination allows exactly a general (possibly, universal) application of the findings.

The second attitude addresses the abandonment of the reason of *utility* in the methodological process of research. If in the k-paradigm there is a dominance of the external demand for results (for example, the problems put to the society functioning), in the d-paradigm, the research is dominantly conducted by an internal logic of the research itself – somewhat, in the d-paradigm, the research produces its own demand.

The third attitude refers to the elimination of the reason of *puzzle*, which is crucial in the k-paradigm. This means that the fractures (dis-continuities) in selecting the problems to be solved constitute the rule, not the exception.[xx]

(c) The rules

There are two fundamental rules in the d-paradigm functioning:

First rule addresses the dominant methodological behaviour – the d-paradigm proceeds to the *anomalies "hunting"*, similarly with the homonymous action in the k-paradigm. This rule is useful, especially including the (possible) inter-paradigmatic transitions.

The second rule refers to the dominant methodological procedure – the d-paradigm proceeds to the *verification of concordance*. This procedure is very different from the verification of correspondence in the k-paradigm. This rule ensures the consistency between the d-paradigm and the scientific finding, not between the scientific finding and the factuals.

(d) The logic

(d1) The research impulse

The scientific research impulse in the d-paradigm is generated by two interrelated factors: (1) the massive anomalies produced by the normal research (as this concept was introduced above). In this context, the doctoral and post-doctoral research of excellence is the last "line of defence" of current paradigms in each field, faced with anomalies; (2) the internal logic of the d-paradigm, which does not claim from the internal logic of the k-paradigms, possibly integrated into a d- paradigm.

(d2) The paradigmatic interferences

As suggested above, inside a d-paradigm could interfere among them, more k-paradigms, each of them being specific to the homogenous [xxi] scientific communities that develop doctoral and post-doctoral scientific research of excellence. Inside a d-paradigm, the interferences of (sectoral/areal) k-paradigms contained do not obey the logic of transition between successive such paradigms (which are, as Kuhn said, incommensurable between them), because they do not experience competition between them.

(d3) The validation criterion

The validation criterion in a d-paradigm is no longer the factual falsifiability (Popper's criterion), but the comparison between the scientific finding and the scientific standards

of the d-paradigm. Consequently, the validation criterion does not obey any k-paradigm's "territoriality" within the d-paradigm involved.

The classes of approach in doctoral and post-doctoral research

In the light of the concept of d-paradigm, i.e., of the doctoral and post-doctoral scientific research, seven classes of research approach can be identified. In this paragraph, I will shortly characterize these classes.

(A1) Approach of corroboration/supporting
Is aimed at supporting the findings and is focused on factual examinations. This class of methodological approach within the d-paradigm has the *narrowest sphere* (from a quantitative point of view) of the doctoral and post-doctoral scientific research. It is used especially for the cases that are considered crucial (experimentum crucis).[xxii]
The impact: eliminating of the cases likely to produce refutations, on the one hand, and increasing the probability that the scientific results already obtained are valid from the perspective of truth, on the other hand.[xxiii]

(A2) Approach of refutation/rejection
It considers only factual (empirical) approaches constitutes an *important* (quantitatively) component of doctoral and post-doctoral scientific research, and it is is the only approach that preserves (provisionally, temporarily) the deterministic validity of scientific results when a refutation (refutation) does not occur.
The impact: it is the only approach that definitively invalidates the hypothesis/conjecture/theory tested; more exactly, a single factually refutation is sufficient.

(A3) Approach of completion/closing
This approach has nothing to do with factual matters (it does not consider the correspondence criterion of truth), so that, it constitutes the *most important* component, quantitatively, of doctoral and post-doctoral scientific research. Logically, it represents a Gödel-type analysis: theoretical verification of the exhaustiveness of the derived conclusions (theorems, lemmas, etc.), which are "required" by an explanatory theory or model, having as its finality the identification of potential anomalies within the d-paradigm – the "list" of anomalies will then substantiate the priority research directions.
The impact: providing, for each of the sectoral k-paradigms, the doubts generated by the specific anomalies.

(A4) Approach of internal consistency/non-contradictoriality
It has nothing to do with factual matters (does not consider the correspondence criterion of truth), in fact, it represents a *semiotic* type analysis (especially semantic and syntactic) (*Nota bene*: the pragmatic side of semiotics is not addressed). Its purpose is to ensure the correct, logically and grammatically, formation of statements within the d-paradigm without the rigidity of logical positivism (in the sense that metaphysical concepts are also accepted in the "economy" of propositions).
The impact: it provides a "sanitary" type of criteria for evaluating the formulation of theorems, lemmas and consequences (e.g., avoiding propositional paradoxes, especially self-referential ones).

(A5) Approach of coherence/convergence
It does not deal with factual matters (does not consider the correspondence criterion of truth), and constitutes an *important*, *qualitative* component of the doctoral and post-doctoral scientific research. So, it examines the results already obtained, with the aim of their mutual reinforcement mutual (this reinforcement of current results is assessed from the perspective of achieving the finality of the d-paradigm). The evaluation of coherence is done by identifying (and measuring, if possible) the added value, through each obtained result, to the "image" of the d-paradigm.
The impact: obtaining a synergistic effect of the results obtained towards the plenary implementation of the d-paradigm.

(A6) Approach of generalization/de-contextualization
This approach, also, has nothing to do with factuals (does not consider the correspondence criterion of truth) constituting the *most important qualitative* component, of the doctoral and post-doctoral scientific research. It examines the premises/assumptions of the hypotheses issued and used within the d-paradigm, in order to eliminate all accidental localities, and relaxes, from a conceptual point of view, the premises/assumptions to re-obtain the targeted scientific results, in a form with a higher degree of abstraction/generalization. In addition, it builds new formalisms/languages that aggregate the "species" of results into types of results, and the types of results into categories of results.
The impact: increasing the degree of approximation to the axiomatized form of the domains in the k-paradigms involved in that d-paradigm.

(A7) Approach of external consistency/concordance
This approach could use, also, rather occasionally, the factuals. It verifies, in general, the system of axioms/principles/categories that govern the doctoral and post-doctoral scientific research, and verifies, in particular, whether the results obtained verify the founding axioms of the theory (*Nota bene*: at a high level of abstraction, verification of concordance can be a substitute for verification of truth-correspondence, by using the transitivity property:

$$(T_k \rightarrow L_j) \wedge (F_i \bowtie L_j) \rightarrow F_i \bowtie T_k$$

where: T_k is the theorem „k"; L_j is lemma „j"; F_i is the factual „i"; $\bowtie$ is the logical constant meaning „*verifies*"; $\rightarrow$ is the logical constant meaning „*implies*".
The approach demonstrates the conjectures issued in the specific domains of the k-paradigms included in the d-paradigm or, as the case may be, demonstrates the impossibility of demonstrating the conjectures in question.
The impact: reduces the risk of conceptual, methodological or instrumental developments that are contradictory to the philosophical foundations of the theories involved in the k-paradigms of the given the d-paradigm.

Conclusions

I propose three methodological profiles of the scientific researchers involved in the doctoral and post-doctoral scientific research of excellence, that is, of researchers who are" habituated" in the d-paradigm. : (1) Apollonian profile (AP); (2) Dionysian profile (DP); (3) Promethean profile (PP). A short characterization of each of these methodological profiles is provided next.

(1) Apollonian profile
This methodological profile is characterized by the following attributes:

- the dominance of rationality (rational re-construction of the knowledge object);[xxiv]
- the factuality is the sovereign (of last resort) criterion to test the truth, which means that the truth is of correspondence-truth type;
- the dominance of the deductive approach of the knowledge object;
- the exclusivity of the positive propositions (statements) in the phenomenological description of the knowledge object. This means that both verbal and formal (non-verbal) statements have only positivist referentials (i.e., denotations), so that they are factually testable;
- the dominance of the explanation, i.e., the dominance of a unique description of causality, means the dominance of explicative models.

(2) Dionysian Profile
This methodological profile is characterized by the following attributes:

- the dominance of linguistic models (either logical or quantitative) which verify the criteria of a language game;[xxv]

- "democracy" regarding the simultaneous existence of intelligibility (which addresses the comprehension/intuition) and causality (which addresses the intellect/explanation) as principles of grounding the knowledge;[xxvi]
- the toleration of metaphysics in the propositional statements on the knowledge object, which means that testing the truth is no longer factual, but logical;
- accepting of an inductive approach as generators of hypotheses and conjectures, of course, by preventing the logical paradoxes that accompany, usually, the inductive generalization;
- maintaining the quasi-general character of the explicative-comprehensive models.

(3) Promethean profile

This methodological profile is characterized by the following attributes:

- the dominance of the philosophical ground of the cognitive modelling; this implies constructions and re-constructions of systemic type, which pass beyond a simple sectoral modelling;
- a major interest in the homogeneity of the topics approached. This means that the identification of the topics (problems) to be examined is made by interrogating their "fitness" with the logical and philosophical bases of the k-paradigms inside the d-paradigm;[xxvii]
- the dominance of the effort of de-contextualizing (de-localizing) of both research as such, and of research findings, that is:
  - any local result is considered under-developed and destined to be re-examined in research;
  - local results are considered mere clues to the authentic, which must be non-local.
- the quasi-complete lack of the inductive approach. Although the empirics continues to occasionally inspire the formulation of cognitive hypotheses, this branch of knowledge is becoming minor;
- a structural propensity to trans-disciplinary theoretical constructions. This is possible by (synergistically) morphological combinations of the k-paradigms involved in the d-paradigm.

A synoptic view on the three methodological profiles are shown in Figure 1

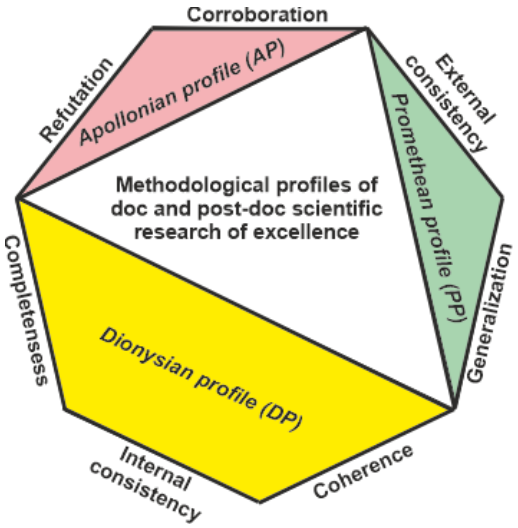

Figure 1. A synoptical view of the three methodological profiles
(Source: Author's research)

Annex 1: d-paradigm's performance positioning related to the typology of sciences

Annexe 1 shows the status quo of applying the d-paradigm in different fields of science, correlated with the scientific level reached. Of course, the suggestions for development in the matter constitute the main "function" of the Figure 2.

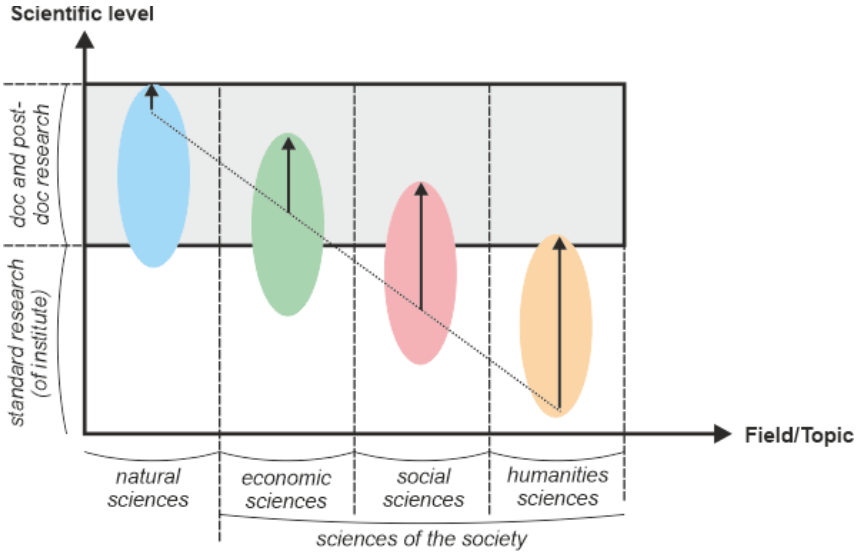

Figure 2. The positioning of d-paradigm from performance perspective in sciences
(Source: Author's research)

Annex 2: About the concept of problematization in the d-paradigm

The concept of question in research activity is generated by the combinations, two by two, of the "i"s in what I call interrogative square (Figure 3):

- first "i": *in-completeness* – identifies one or more structural absence in the research approach/program. This is an interrogation of structural type (S), and it is interested of *ontology*;
- second "i": *in-consistency* – identifies the logical contradictions in the research approach/program. This is an interrogation of consistency type (C), and it is interested by *causality*;
- third "i": *in-coherency* – identifies the invalidities according to a set of rules, in the research approach/program. This is an interrogation of syntactic type (F), and it is interested of *intelligibility*;
- fourth "i": *i-relevance* – identifies the particular/concrete/local features of the research approach/program. This is an interrogation of value type (V), and it is interested of *justification*.

By combining, two by two the four types of interrogations, we obtain the six fundamental classes of questions that must be put in a d-paradigm:

(1) (EQ) question about existence: the interrogation S-C;
(2) (VQ) question about viability: the interrogation S-F;
(3) (AQ) question about adequacy: the interrogation S-V;
(4) (FQ) question about functioning: the interrogation C-F;
(5) (GQ) question about grounding: the interrogation C-V;
(6) (LQ) question about legitimacy: the interrogation F-V.

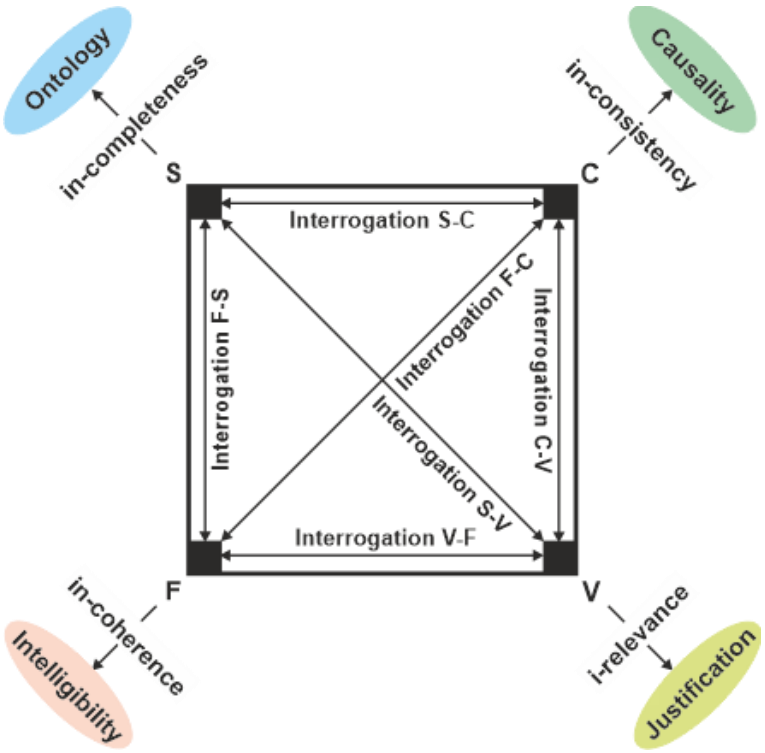

Figure 3. The interrogative quadrilateral to generate the questions in a d-paradigm *(*Source: Author's research)

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Notes

[i] I narrow the discussion to the human being, here.

[ii] The basic such forms of intuition, that are transcendental, are: space and time, based on which the entire experience is possible and structured.

[iii] The reality is composed of three „areas": (a) the objective reality – it is independent form the subject (Popper's first world); (b) subjective reality – it is exclusively dependent on the subject (Popper's second world); (c) objectified reality – artefacts, of any nature, of the individual and society, the so-called world of the objective content of the thought (Popper's third world).

[iv] The basic supposition of Lakatos's proposal of the concept of research program is that there is a difference between fallibilism and falsifiabilism. *Nota bene*: such a distinction was not made by Kuhn, nor by Popper.

[v] Logically, the proximal genus together with the specific differences constitute exactly the content of the concept of sufficiency predicates.

[vi] Or, equivalently, belongs to Popper's third world.

[vii] See, here, e composition fallacy (e.g., the paradox of saving), Lucas's criticism, the impossibility of aggregating individual indicators (Arrow, Păun) and others.

[viii] For the impossibility to use the induction in the economic/social field, see, for example, Russell's chicken paradox, or Hempel's crow paradox.
[ix] There are propositions to find the so-called conservation laws (similar to the conservation laws in Physics), belonging to the German mathematician Amalie Emmy Noether, on the idea that any invariant corresponds to a conservation law; however, in the economic/social field, the mathematical modelling has no general character, but an illustrative or, at most, methodological, not conceptual one.
[x] Let us remember that Einstein said, even for the case of natural sciences (in fact, for Physics), that „imagination is more important than knowledge".
[xi] It is worth mentioning that the (heuristic) invention is very different from induction. Probably, such an invention could be a species of abduction.
[xii] The invariants that I have discussed are, of course, just these laws of movement.
[xiii] Generally, the taking over (memetically) the others' behaviour is not inferred from any model of rationality.
[xiv] It seems that such a (temporal, not logical) inversion between cause and effect in their traditional understanding also occurs in the Quantum Mechanics processes. Nota bene: this encourages some attempts at rapprochement between economic theory and the quantum theory, in what could be called Quantum Economics (I will come back another time to develop such an interesting and, as I think, productive idea).
[xv] A causal mechanism is a proxy for the cause, like the correlation, by the way. The causal mechanism does not go until the ultimate cause (the „true" cause, i.e., the cause of last instance, either as *causa efficiens* or *causa finalis*, after the case). This state of affairs is an objective impossibility, not a contingent situation generated by incompetence or lack of knowledge.
[xvi] There are three categories of paradigm: (a) cognitive paradigm, where the Kuhnian paradigm is included; (b) praxiological paradigm; (c) practical paradigm (Dinga *et al*., 2022).
[xvii] The syntagma "*normal research*" is, obviously, a terminological contagion from the syntagma "normal science" in the k-paradigm.
[xviii] I will come back, into a next intervention, with an essay on the issue of interdisciplinarity and trans-disciplinarity, respectively.
[xix] The internal logic of knowledge is much more important in fundamental research than in applied or even development research. Consequently, the choice of fundamental research programs (themes, subjects) should be left to the researchers themselves, who are the only ones capable of genuine problematization.
[xx] It is worth mentioning that this attitude is not at all contradictory with the second one, namely with the internal logic of conducting the research: exactly the internal logic of developing research can observe and, so, address the fractures/ruptures or discontinuities in the research process. *Nota bene*: I remind you here of Foucault's insistence on approaching the (general) factual history through its discontinuities, not its continuities.
[xxi] That is, sharing the same general topic of research.
[xxii] Two examples of experimentum crucis type: (a) in the natural science (Physics): Michelson-Morley experiment (regarding the ether), or measuring of the light trajectory near Sun (regarding the space curvature); (b) in the social science: testing the rational vs. emotional decision-making of individuals.
[xxiii] To be observed that, here, a new difference between the k-paradigm and the d-paradigm occurs: in the d-paradigm the successive corroborations increase the probability of corroboration in the future, while in the k-paradigm the current corroboration is indifferent related to the next testing.
[xxiv] A model of rationality is a logical model of grounding, i.e., of constructing an intelligibility based on belief/credence.
[xxv] See, here, the suggestions of Wittgenstein.
[xxvi] The intelligibility is a form of phenomenalism that creates convictions, not certainties.
[xxvii] There is, here, some propensity towards preservation of the "normal science", in the sense of the Kuhnian concept of paradigm (i.e., the k-paradigm).